

W. R. HARDCASTLE.
Rail-Joint.

No. 219,088.

Patented Sept. 2, 1879.

Fig. 1.

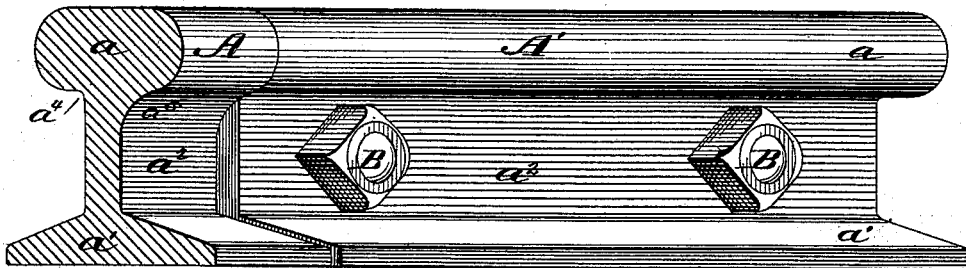


Fig. 2.

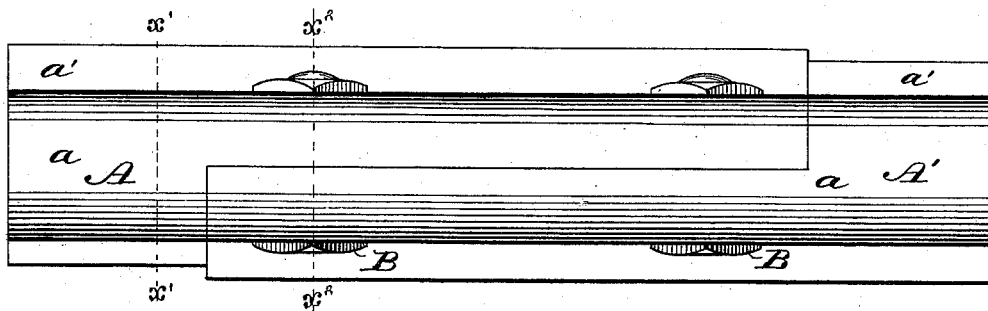
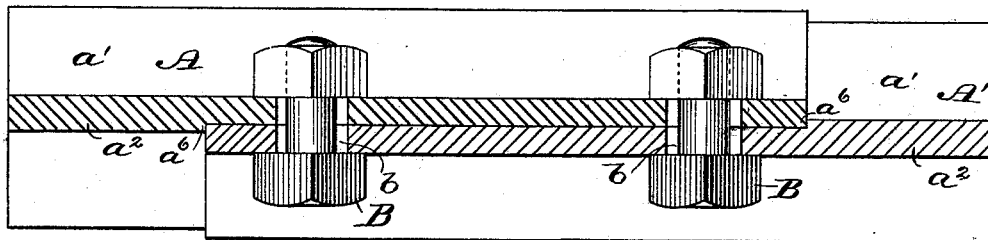


Fig. 3.



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Fig. 4.

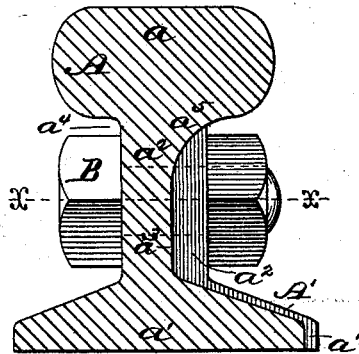


Fig. 5.

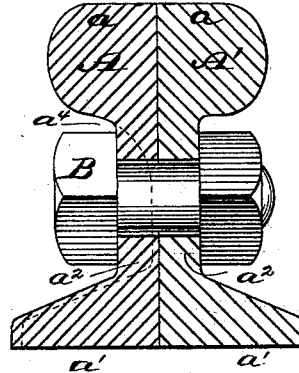
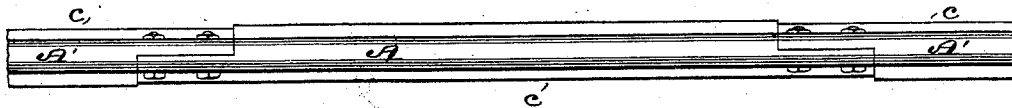


Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM R. HARDCASTLE, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF HIS RIGHT TO AUGUSTE B. EWING, OF SAME PLACE.

IMPROVEMENT IN RAIL-JOINTS.

Specification forming part of Letters Patent No. **219,088**, dated September 2, 1879; application filed June 13, 1879.

To all whom it may concern:

Be it known that I, WILLIAM R. HARDCASTLE, of the city of St. Louis, Missouri, have made a new and useful Improvement in Railway-Joints, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a view, in perspective, of the improvement; Fig. 2, a plan of the same; Fig. 3, a horizontal longitudinal section taken on the line xx of Fig. 4; Fig. 4, a vertical cross-section taken on the line $x^1 x^1$ of Fig. 2; Fig. 5, a vertical cross-section taken on the line $x^2 x^2$ of Fig. 2, and Fig. 6 a plan showing three rails united by the present joint.

The same letters denote the same parts.

In making railway-joints the usual practice is to butt the ends of the rails together and use a fish-bar splice. In some instances, in place of butting the rails, a plain rabbeted scarf has been used, the rail being of the ordinary shape, and the rabbet extending to the center of the web of the rail. In some cases, also, rails have been united by a lap-joint, the laps being formed out of projections with which the rails at their ends have been furnished, the projections being bent or out of line with the web of the rail.

The chief objection to such a joint as first named is, that it is weaker than the rail proper. It is also very difficult to keep the bolts tight and the fish-bars in place against the rail. The last-named joint is exceedingly expensive.

The principal aim of the present improvement is to readily and economically provide a railway-joint that is fully as strong as the remainder of the track.

A further advantage is, that it avoids the use of fish-bars or any detachable splint or part in the nature of a splice.

It consists in rails constructed to bring the web of the rail to the side of the vertical axis of the rail or the line drawn vertically through the center of the tread, and scarfed together so as to bring the treads of the rails in line

with each other, but so as to cause the webs of the adjoining rails or the principal portion of the webs to lap.

The preferable mode of carrying out the improvement is shown in the annexed drawings, where $A A'$ represent the abutting ends of two rails in a line of railway.

The shape of the rails is indicated more distinctly in Fig. 4—that is, the tread a and foot a^1 are of the usual form, saving as modified by the location of the web a^2 , which, instead of being arranged centrally in the rail, as is customary, is arranged eccentrically to the vertical axis passing through the center of the tread, and preferably sufficiently so as to bring the side a^3 of the web nearly in line with the center of the tread.

The rail at a^4 is squared out as much as is practicable, while on the other side of the web, at a^5 , it is made in the usual way. The joint is then formed by rabbeting out the ends of the rails and laying them together, as shown in Figs. 1, 2, 3, the rabbet being formed in the side of the rail opposite to the one containing the web, and extending inward to the center of the tread and foot of the rail, and longitudinally in the rail to any suitable distance—preferably, say, seven inches.

The joint should be supported by a tie, in the usual manner, and it is desirable to perforate the scarfed ends, and use bolts $B B$ to tie the ends laterally. The perforations $b b$ are preferably elongated.

In consequence of the rails being made and joined as described, the feet $a^1 a^1$ of adjoining rails do not come in line, as seen in Figs. 2 and 3, and in a line of railway the rails are laid as shown in Fig. 6, bringing the offsets $c c$ first on one and then on the other side of the line of rail.

The rails, however, may be shaped to bring the feet even.

It will be seen that in the joints the webs of the adjoining rails lap, serving to greatly strengthen the construction at points that hitherto have been the weakest in the railway.

It is desirable for the center of the foot of

the rail to be in line with the center of the tread, as shown; (but in making the foot I do not wish to be limited to any particular form.

In making the rail the entire web may be outside of a line drawn vertically through the center of the tread; but I prefer to make the web so that the scarf shall cut slightly into it, as shown at a^6 , Fig. 3.

I claim—

The combination of the rails A and A', said rails having the webs a^2 a^2 arranged eccentrically therein throughout the rails, and being scarfed together, as and for the purposes described.

WM. R. HARDCASTLE.

Witnesses:

SAML. S. BOYD,

CHAS. D. MOODY.